

What is claimed is:

1. An image capturing unit comprising:

a variable optical element;

5 an optical unit which is disposed on a light-incident end of the variable optical element; and

a light-flux limiting section, wherein

the variable optical element includes a first liquid member, a second liquid member which does not mix in the first liquid member, and a container which contains the

10 first liquid member and the second liquid member;

an interfacial shape between the first liquid member and the second liquid member varies according to a voltage which is applied to the liquid members; and

the light-influx limiting section satisfies a following condition (1);

$$0.1 < (\Phi \cdot 2 \times h) < 20.0 \quad (1)$$

15 where Φ (mm) indicates a maximum diameter for an axial light-flux in the variable optical element and h (mm) indicates a highest position of the axial light-flux on the light-incident end of the variable optical element.

2. An image capturing unit according to Claim 1 comprising:

20 an image capturing element; and

a power supplying section, wherein

the power supplying section commonly serves for capturing an image and varying optical characteristics.

25 3. An image capturing unit according to Claim 1 wherein a refractive index in the first

liquid member is different from a refractive index in the second liquid member.

4. An image capturing unit comprising:

a variable optical element; and

5 an optical unit which is disposed on a light-incident end of the variable optical element, wherein

the variable optical elements comprises a first liquid member, a second liquid member which does not mix in the first liquid member, a container which contains the first liquid member and the second liquid member, and an aperture member having aperture
10 sections on both end in which diameters in the aperture sections are different;

the aperture section having a small diameter in the aperture member is disposed near the light-incident end;

an interfacial shape between the first liquid member and the second liquid member varies according to a voltage which is applied to the liquid members; and satisfies
15 following conditions (2) and (3);

$$0.1 < (\Phi_1 - 2 \times h_1) < 20.0 \quad (2)$$

$$0.1 < (\Phi_2 - 2 \times h_2) < 20.0 \quad (3)$$

where Φ_1 (mm) indicates a diameter for a small aperture section in the aperture member, Φ_2 (mm) indicates a diameter for a large aperture section in the aperture member, h_1 (mm)
20 indicates a highest position of the axial light-flux on the light-incident end of the variable optical element, and h_2 (mm) indicates a highest position of the axial light-flux on the interface between the first liquid member and the second liquid member.

5. An image capturing unit comprising:

25 a variable optical element; and

a light-flux limiting section, wherein

the variable optical element includes a first liquid member, a second liquid member which does not mix in the first liquid member, and a container which contains the first liquid member and the second liquid member;

5 an interfacial shape between the first liquid member and the second liquid member varies according to a voltage which is applied to the liquid members; and the light-influx limiting section satisfies a following condition (4)

$$0.5 < S < 20.0 \quad (4)$$

10 where S (mm²) indicates an area for a light flux having a maximum perspective on the light-incident end of the variable optical element.

6. An image capturing unit according to Claim 5 wherein:

the light flux limiting section serves for a cover glass which forms the container; and

15 the light-incident surface serves for the interface between the cover glass and the first liquid member.

7. An image capturing unit comprising:

a variable optical element; and

20 an image capturing element, wherein

the variable optical element includes a first liquid member, a second liquid member which does not mix in the first liquid member, and a container which contains the first liquid member and the second liquid member;

25 an interfacial shape between the first liquid member and the second liquid member varies according to a voltage which is applied to the liquid members; and

an absolute value for R_{12} -d is in a range between 10% and 500% of a length d (mm); where R_{12} indicates a diameter of a curvature of the interface, and d indicates a length for an optical path length of an axial principal light between the interface and a surface of the image capturing element.

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8. An image capturing unit according to Claim 7 wherein the image capturing element is disposed on a light-emitting end of the variable optical element.

9. An image capturing device which is provided with the image capturing unit of Claim

10 1.

10. A mobile phone comprising:

the image capturing unit of Claim 1;

a displaying section;

15 an inputting button section;

a voice inputting-outputting section; and

an antenna.

11. An information terminal comprising:

20 the image capturing unit of Claim 1;

a displaying section; and

a keyboard.

12. An endoscope device comprising:

25 the image capturing unit of Claim 1;

a light source;
a signal processing circuit; and
a power supply section.